

TITLE

KYOTO PROTOCOL OBJECTIVES IN CROATIA ENERGY PLANNING

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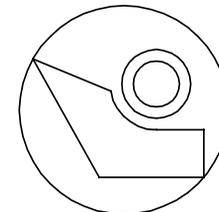
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BACKGROUND

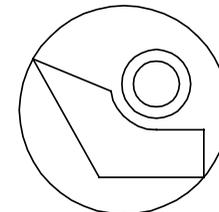


Article 3.1 of the Kyoto Protocol to the UNFCCC

“The Parties included in Annex I shall, individually or jointly, ensure that their aggregate anthropogenic carbon dioxide equivalent emissions of the greenhouse gases listed in Annex A do not exceed their assigned amounts, calculated pursuant to their quantified emission limitation and reduction commitments inscribed in Annex B and in accordance with the provisions of this Article, with a view to reducing their overall emissions of such gases by at least 5 per cent below 1990 levels in the commitment period 2008 to 2012.”



BACKGROUND



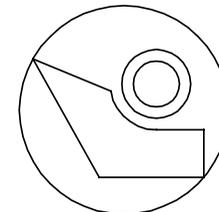
United Nations Framework Convention on Climate Change - 182 countries

Kyoto Protocol, 1997:

- **Reduction in GHG emissions in 38 countries**
- **13 Economies in Transition**
- **Croatia - 5% reduction of GHG from 1990**



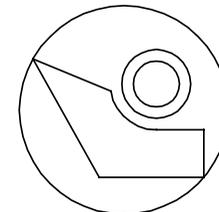
OBJECTIVES



- showing particular case of an economy in transition without “hot air”
- showing that there is urgent need for a climate change national energy strategy that includes the KP commitments



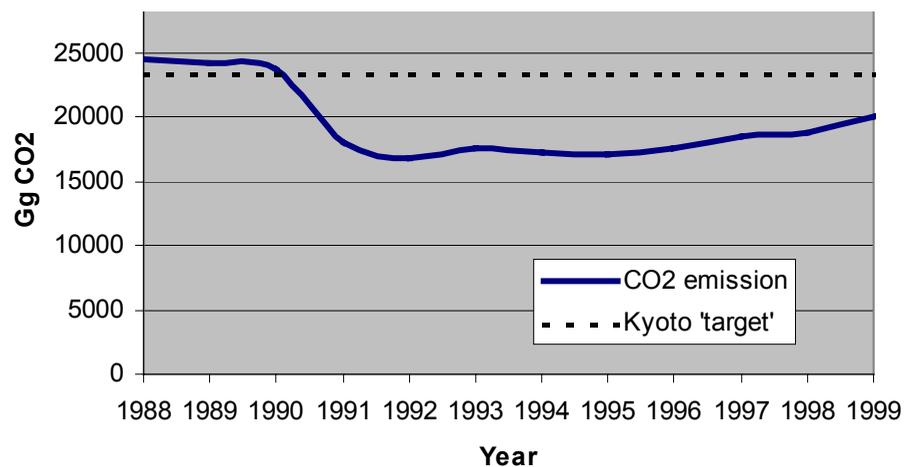
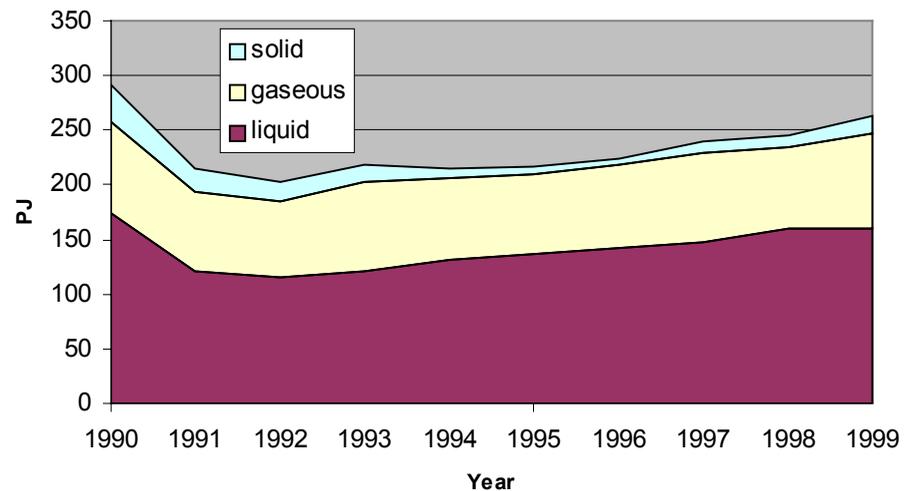
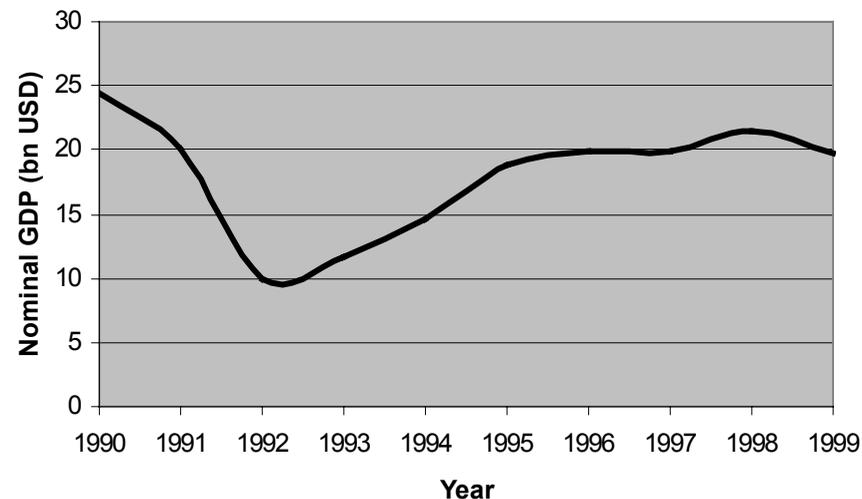
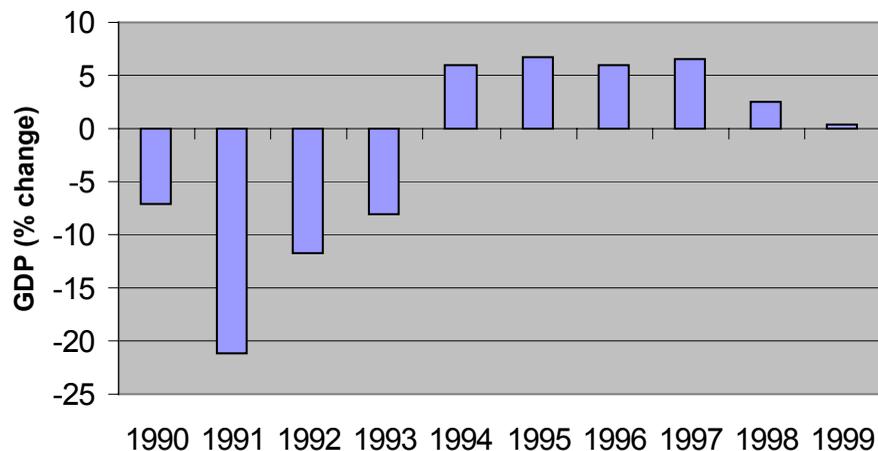
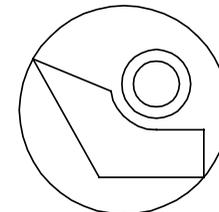
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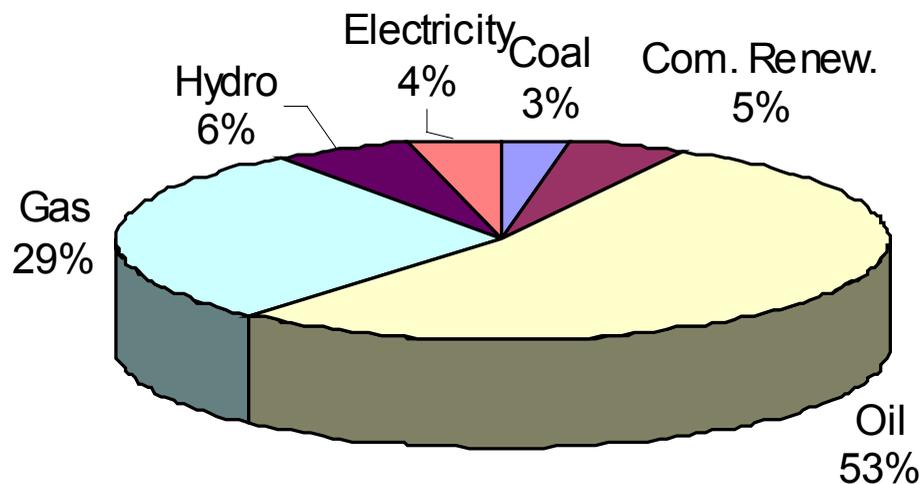
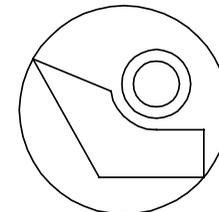
- Current energy picture of Croatia
- Business as usual scenario of gas and coal future
- Low carbon electricity generation scenario
- No fossil fuel electricity generation scenario
- Conclusions



CROATIA - ECONOMY IN TRANSITION



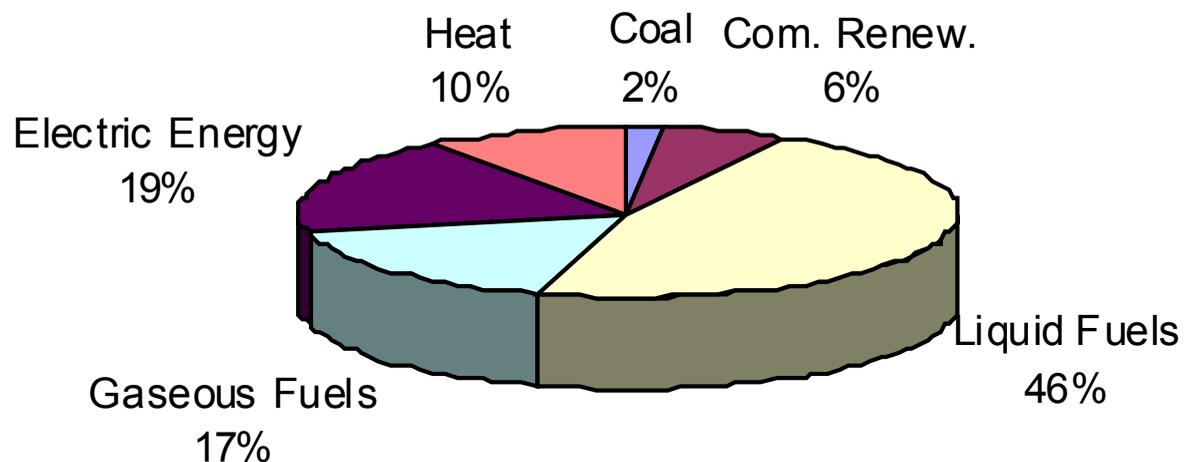
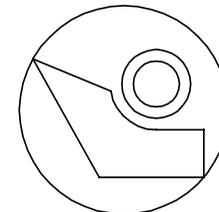
PRIMARY ENERGY



- Total primary energy supply - 7.6 Mtoe
- Per capita 1.6 toe
- Energy efficiency 2.8 USD/kgoe



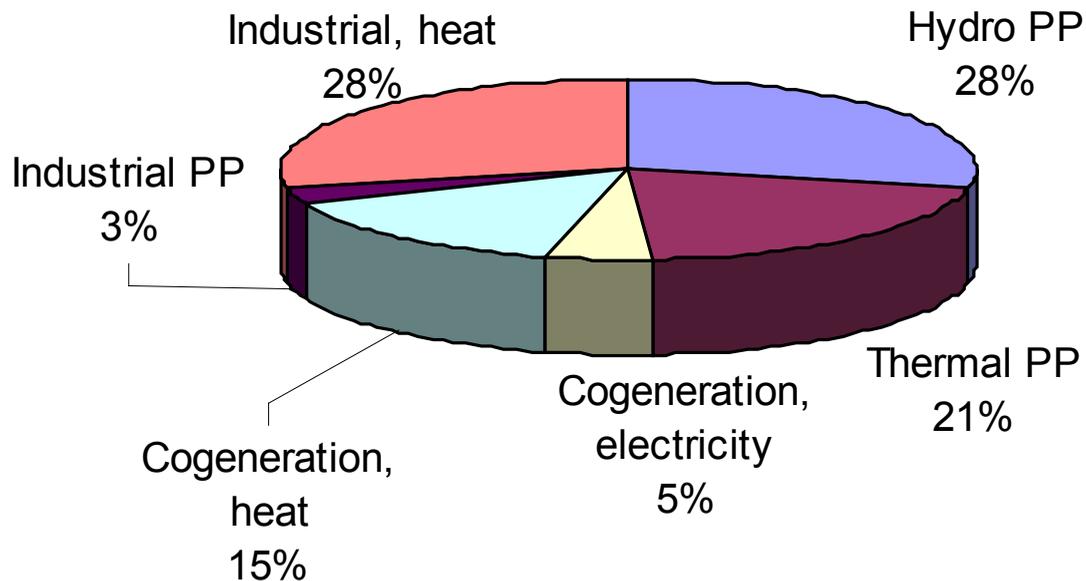
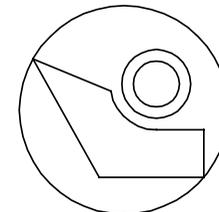
FINAL ENERGY CONSUMPTION



- Total final energy consumption - 5 Mtoe - 213 PJ
- Low importance of coal



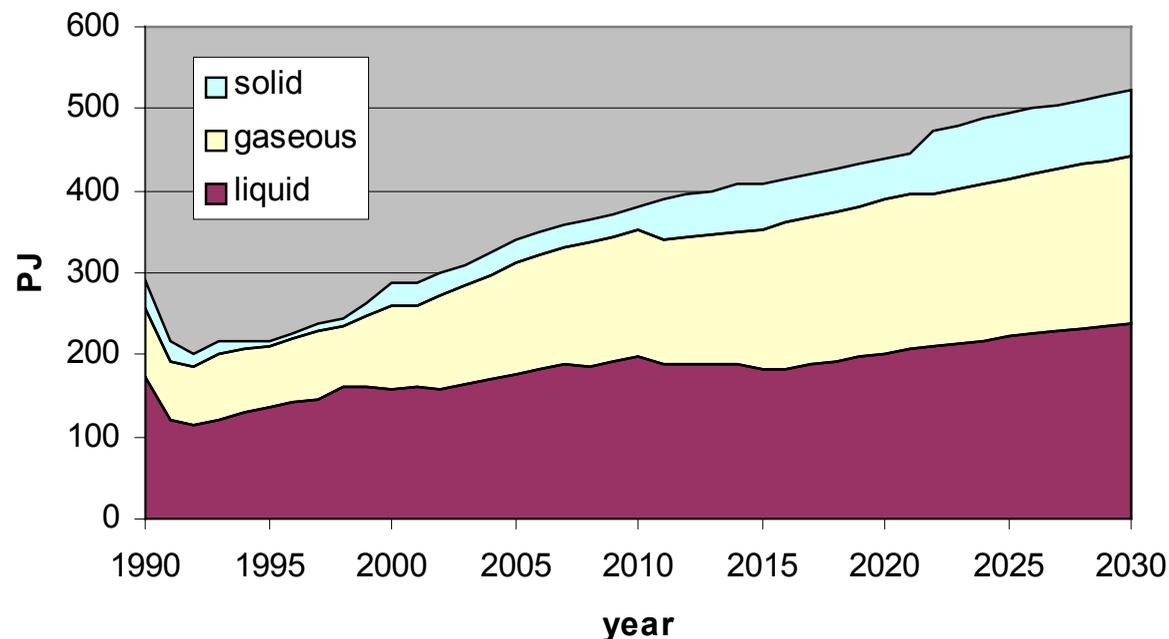
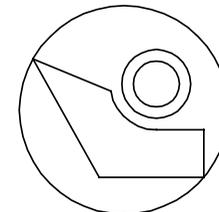
ELECTRICITY AND HEAT GENERATION



- Electricity generated - 10.9 TWh - 39 PJ
- Heat generated - 30 PJ
- Thermal Power Plants - 38 PJ of primary fuel



BUSINESS AS USUAL

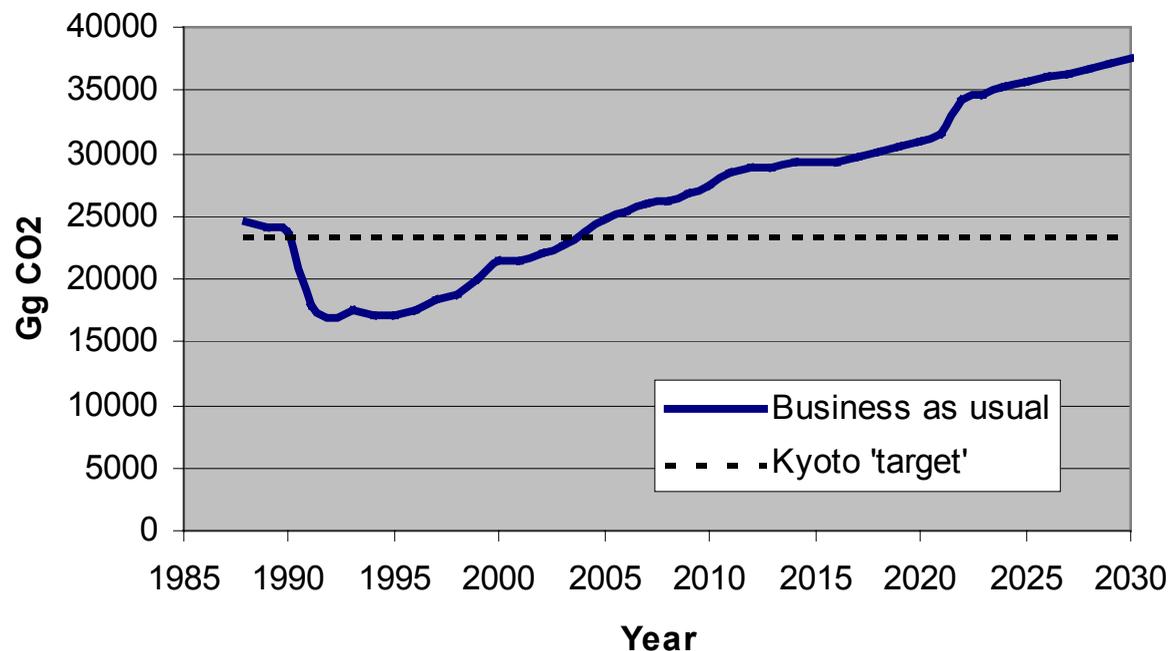
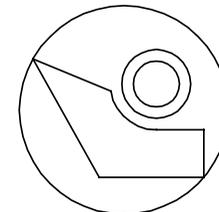


- Based on current National Energy Strategy
- Modelled by ENPEP

- PP: 2100 MW CC, 850 MW coal, 333 MW HPP
- Extensive gasification of coastal regions



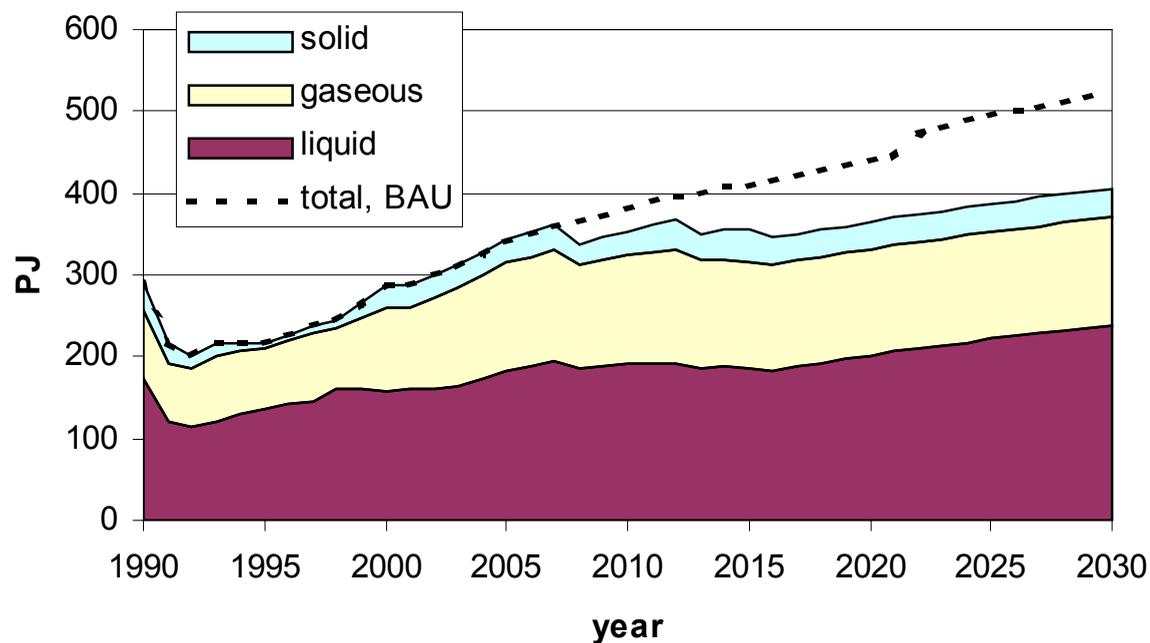
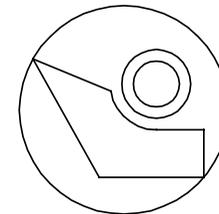
BUSINESS AS USUAL



- Based on current National Energy Strategy
- Modelled by ENPEP
- Breaching the 'target' in 2003
- No "hot air" to sell



MINIMISED CO₂ IN ELECTRICITY GENERATION

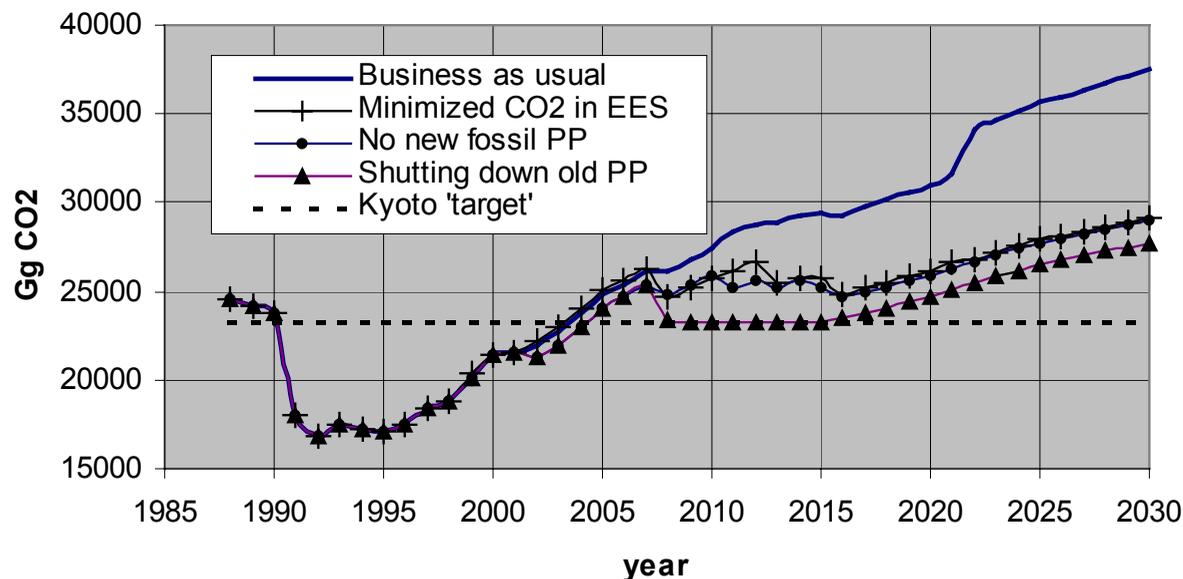
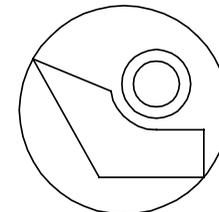


- Low cost CO₂ minimisation only in electricity sector
- Modelled by ENPEP

- PP: 200 MW CC, 3000 MW NPP, 333 MW HPP
- Else as in BAU



MINIMISED CO₂ IN ELECTRICITY GENERATION

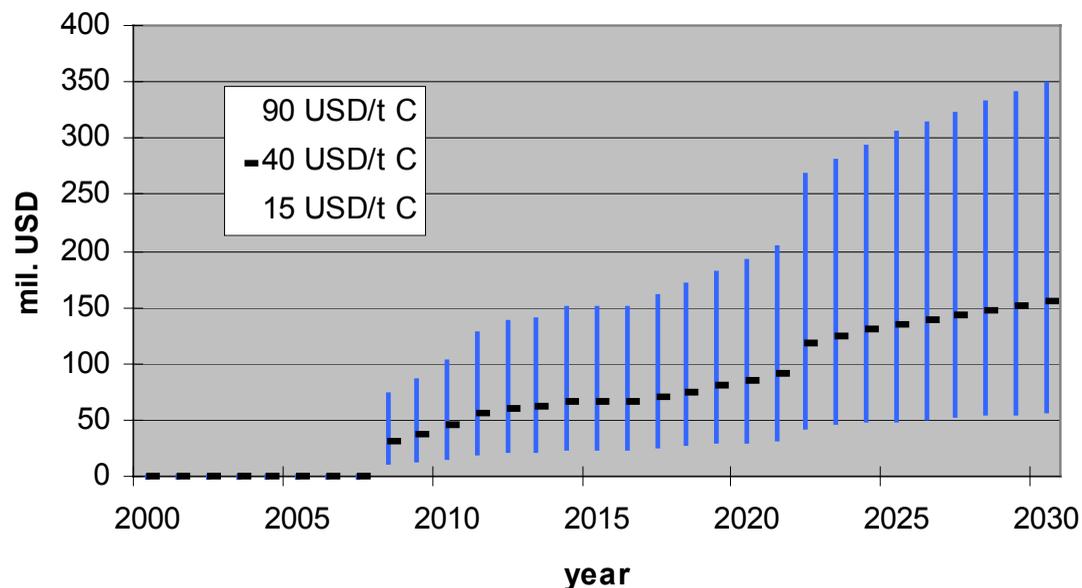
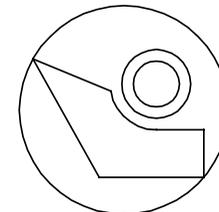


- Breaching the 'target' again in 2003
- Lower overshooting

- Planning electricity generation capacity will not satisfy the KP commitment
- Shutting down old PP prematurely would satisfy the KP commitment only until 2015



FINANCIAL REPERCUSSIONS



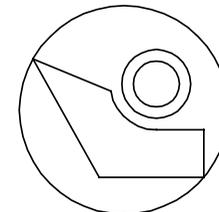
- Funds that should be available for domestic measures

Market price of certificates estimated at 15-40 USD/Mg C, with maximum of the average global mitigation price of 90 USD/Mg C

(based on OECD study that concluded that in case of emission trading the price of CO₂ reduction is 90 USD/Mg C)



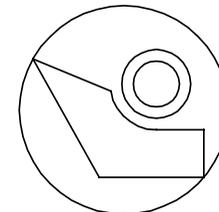
POSSIBLE GUIDELINES



- National Climate Change Strategy necessary
- Low cost domestic measures: space heating, industrial energy efficiency, electricity generation, solar thermal energy (instead of gasification)
- The funds for future buying of certificates could be used for domestic measures



CONCLUSIONS



- Croatia will have no “hot air” to sell
- KP commitments cannot be achieved only through measures in electricity generation sector
- A urgent need for a National Climate Change Strategy